Q) The number of solutions of the equation $\log_{x=1} 2x^2 + 7x + 5 + \log_{(2x+5)}(x+1)^2 - 4 = 0$,

x > 0, is

Correct Answer is **1**

Explanation

$$\log_{(x+1)}(2x^2 + 7x + 5) + \log_{(2x+5)}(x+1)^2 - 4 = 0$$

$$\log_{(x+1)}(2x+5)(x+1) + 2\log_{(2x+5)}(x+1) = 4$$

$$\log_{(x+1)}(2x+5) + 1 + 2\log_{(2x+5)}(x+1) = 4$$

$$Put\ \log_{(x+1)}(2x+5) = t$$

$$t + 2/t = 3 \Rightarrow t^2 - 3t + 2 = 0$$

t = 1, 2

$$\log_{(x+1)}(2x+5) = 1\ \&\ log\ \log_{(x+1)}(2x+5) = 2$$

x+1=2x+3 & 2x+5=(x+1)²

x=−4 (rejected)

x²=4⟹x=2,−2 (rejected)

So, x = 2

No. of solution = 1